

Surface Water Quality Regulation

Speakers

- * Erin Ragazzi, State Board, Div. of Water Rights
 - * FERC 401 Certifications
- * Valentina Cabrera, USEPA
 - * 303(d) Impaired Water Body List
- * Ken Landau, Central Valley Water Board
 - * Everything else

Overview

- * What we protect – beneficial uses
- * Standards used to protect uses
- * What if standards are not met?
 - * 303(d)
 - * TMDL processes
- * Reservoir impacts on water quality
- * Permitting
 - * NPDES, 404, 401, California Water Code
- * CVSALTS
- * Coordinated monitoring

Disclaimer

- * Many things highly simplified
 - * Many 30 second topics could take all day
- * Focused on San Joaquin River watershed
 - * Upstream of Delta
 - * Leaving out many things not applicable to the watershed

Beneficial Uses – what we protect

* Sources

- * Clean Water Act – Fishable / Swimmable
- * State Board – Sources of Drinking Water Policy
- * Water Quality Control Plans (Basin Plans)
 - * Set beneficial uses for each water body
 - * Water quality objectives to protect the uses
 - * Implementation plans

Sacramento/San Joaquin Rivers & Tulare Lake Basin
Plans

Beneficial Uses In Basin Plan Surface Waters

- * Municipal and Domestic Supply
- * Agricultural Supply
- * Industrial Service Supply
- * Industrial Process Supply
- * Ground Water Recharge
- * Freshwater Replenishment
- * Navigation
- * Hydropower Generation
- * Water Contract Recreation
- * Non-Contact Recreation
- * Commercial and Sport Fishing
- * Aquaculture
- * Warm Freshwater Habitat
- * Cold Freshwater Habitat
- * Estuarine Habitat
- * Wildlife Habitat
- * Preservation of Biological Habitats of Special Significance
- * Migration of Aquatic Organisms
- * Spawning, Reproduction and/or Early Development
- * Shellfish Harvesting

WR v. WQ Beneficial Uses

Water Rights (T23 CCR, Subarticle 2)	~ Water Quality (Basin Plan)
Domestic Uses	Municipal and Domestic Supply
Irrigation Use	Agricultural Supply
Power Use	Hydropower
Municipal Use	Municipal and Domestic Supply
Mining Use	Industrial Process Supply
Industrial Use	Industrial Process Supply
Fish and Wildlife Preservation and Enhancement Use	COLD, WARM, COMM, WILDLIFE, SHELLFISH, MIGR, SPAWN, PRESERVE
Aquaculture Use	Aquaculture
Recreational Use	Water Contract and Non-Contact Rec
Stockwatering Use	Agricultural Supply
Water Quality Use	---
Frost Protection Use	Agricultural Supply
Heat Control Use	Agricultural Supply

Beneficial Uses In Basin Plan Ground Waters

- Municipal and Domestic Supply
- Agricultural Supply
- Industrial Service Supply
- Industrial Process Supply

Beneficial Use Tables

- * Basin Plan contains tables listing beneficial uses for water bodies.
- * Not all water bodies listed
- * “Tributary Rule”
 - * Beneficial Uses listed in the Tables are applied to tributary “streams” that are not listed in the Basin Plan
 - * Tributary Rule does not apply to constructed water bodies

Water Quality Standards

- * The Clean Water Act requires each state to adopt water quality standards
 - * Sources:
 - * USEPA – California and National Toxics Rules
 - * State Board – Bay/Delta Plan
 - * Regional Board - Basin Plan
 - * Consists of
 - * Designated Uses
 - * Water Quality Criteria based upon the uses
 - * Anti-Degradation Policy

Types of Objectives

- * Numeric – a specified number
 - * USEPA – National and California Toxics Rules
 - * State Board
 - * Bay Delta Plan
 - * Delta salinity
 - * SJR dissolved oxygen at Stockton
- * Basin Plan
 - * Delta heavy metals
 - * Dissolved Oxygen
 - * Some salinity standards
 - * Primary and Secondary MCLs

Types of Objectives

- * Narrative – does not specify a number
 - * Clean Water Act – fishable / swimmable
 - * Basin Plan
 - * No toxics in toxics amounts for aquatic life
 - * Chemicals can't impair beneficial uses
 - * Consider interaction of pollutants
- * Site-specific interpretation of narrative
 - * Review applicable science / literature
 - * Ammonia, chlorine, temperature....

Objectives can be variable

* Ammonia

- * Toxicity varies with pH and temperature
- * Increasing pH = increased fish toxicity
- * Decreasing pH = increased copepod toxicity

* Metals

- * Copper: Acute Toxicity = $e^{(0.9422 + \ln[\text{hardness}]) - 1.700}$
- * Increasing hardness = decreased toxicity

** Reservoirs, wheeling water, etc. can change receiving water temperature, hardness & pH

- * Changes toxicity of some pollutants

Concern with objectives

- * Keep discharging pollutants until river is “full” of pollutants up to maximum allowed by each objective?
 - * No one downstream can discharge anything more
 - * No safety factor if an objective is wrong
 - * Don't understand most interactions
 - * Do we want every water body just barely able to support beneficial uses?

Anti-Degradation Policy

- * State & Federal versions
 - * Similar, but different in detail
 - * Supplemented by State Board Decisions
- * Preserve existing water quality
- * NO DISCHARGE OF POLLUTANTS unless
 - * To the maximum benefit of the People of the State
 - * Utilizes 'best practicable treatment or control'
 - * Practicable includes economics
 - * Situation-specific determination
 - * Determined with adoption of permit

When objectives aren't attained

* 303d

TMDL Prioritization/Scheduling

- * 303(d) List – TMDL completion schedule
- * Approximate dates of Board adoption
- * SWRCB Listing Policy Section 5 TMDL Scheduling Criteria
 - * Waterbody significance
 - * Degree of Impairment
 - * Potential for protection and recovery
 - * Public Concern
 - * Funding
 - * Data availability
 - * Other criteria
- * Triennial Review (e.g. TMDLs for all 2006 303(d) list by 2019)
- * Strategic Plan -
- * Delta Plan
- * Board Direction
- * Basin Plan Requirements

Regulatory Options

Impaired Waters Policy (State Board, 2005)

- * Delist- standards are met
- * Correct the standard
- * Certification of Regulatory or Non-Regulatory Action
- * Board resolution establishing the TMDL - Single action by the Board-
- * **Basin Plan Amendment establishing TMDL**

What is a TMDL

- * Scientific process to determine the Total Maximum Daily Load for a given pollutant that can be discharged to a waterbody and achieve compliance
- * Considers natural and human contributions

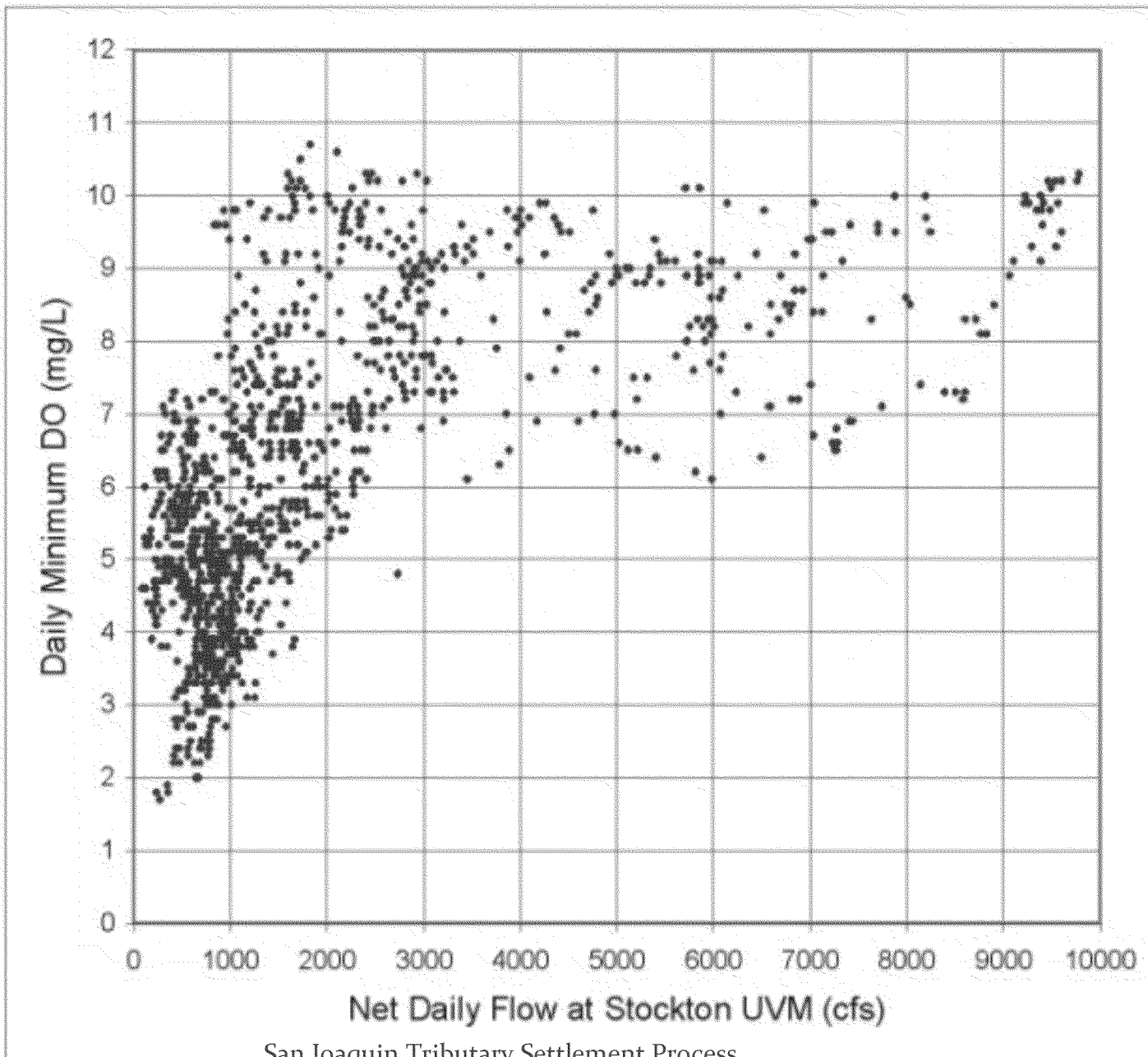
TMDL Process

- * Determine / evaluate water quality objective:
 - * Use existing objective – Vernalis EC standard
 - * Adopt new objective in Basin Plan – diazinon
- * Determine existing sources and associated loads
- * Determine needed load reductions
- * Develop implementation plan and schedule
 - * Phases, re-evaluation points

Flow in TMDLs

- * Dilution – dilution is NOT a beneficial use
 - * Possible waste and unreasonable use
- * Change hardness / pH/ temperature
- * If objectives cannot be met only with pollutant controls, or if controls are draconian, flow augmentation may be recommended
- * State Board would have to implement flow changes
- * Stockton Deep Water Channel / DO
 - * Increased flow reduces residence / reaction time

Figure 4-3: Dissolved Oxygen Concentrations versus Flow



Basin Plan adoption process

- * Scoping session
 - * Basin Plan is CEQA-equivalent process
- * Stakeholder process
- * Develop proposal(s)
- * 45 day public comment period
- * Regional Board hearing / adoption
- * State Board hearing / adoption (RB staff)
- * Office of Administrative Law review
- * USEPA approval of objectives

SJR Basin TMDLs

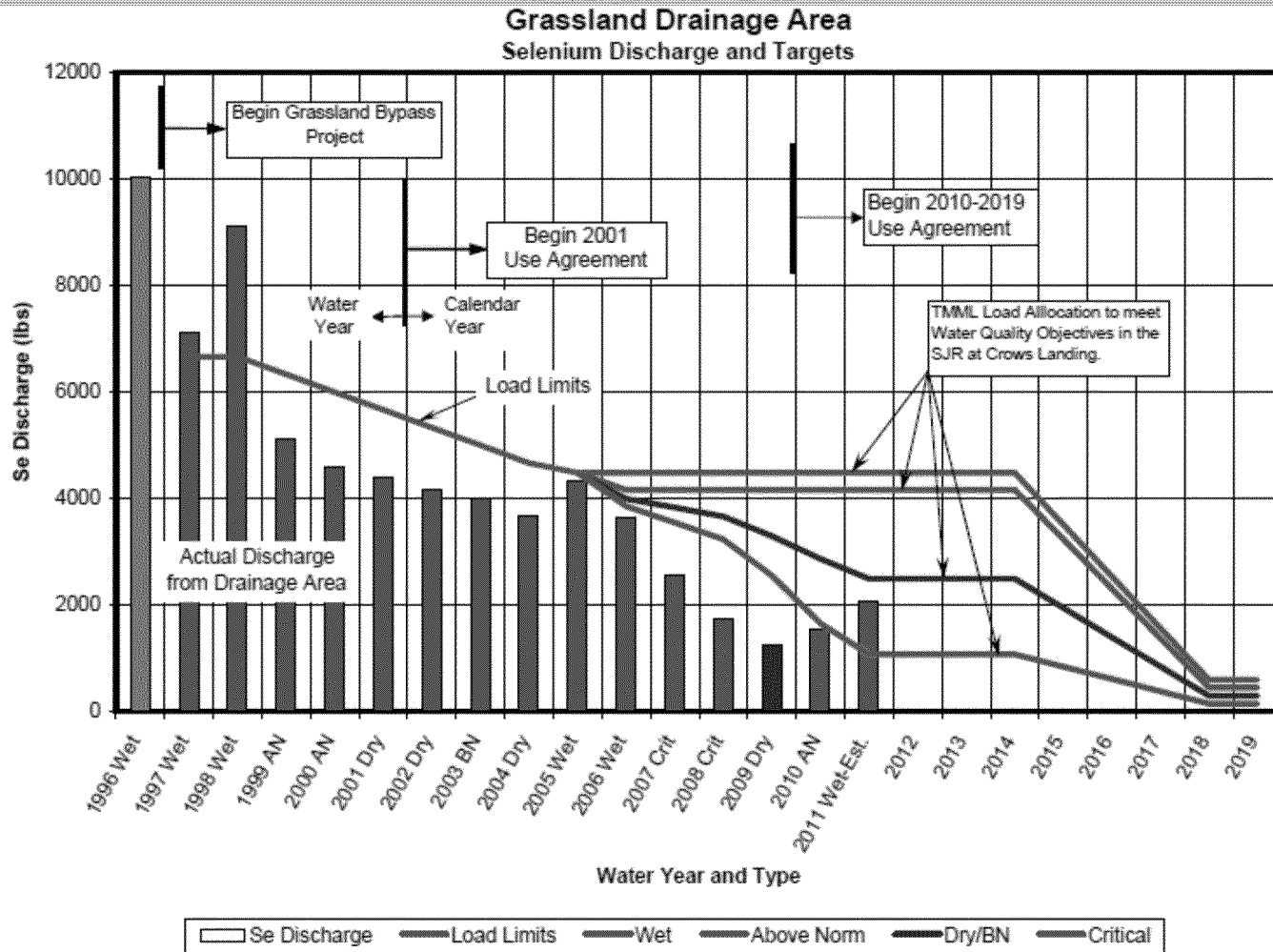
- * Adopted

- * Selenium
- * Diazinon and Chlorpyrifos
- * Dissolved Oxygen - Stockton Deepwater Ship Channel
- * Salt & Boron between Stanislaus River and Vernalis

- * In Development

- * Upstream salt (CV SALTS)
- * Tributaries diazinon and chlorpyrifos
- * Other Pesticides: diuron, pyrethroids (tributaries), organochlorines

Selenium



SJR Diazinon and Chlorpyrifos TMDL

- * Insecticides commonly used by ag (common urban use before 2005)
- * Acute toxicity to aquatic invertebrates – 303(d) list.
- * TMDL Approved in 2006 by EPA
- * Main Stem SJR WQOs, TMDL -concentration-based
- * Implementation + Monitoring Requirements
- * Allocations, Loading Capacity concentration based
 - * don't vary with flow changes
 - * dilution increases assimilative capacity.
- * East and Westside Coalitions Monitor + Report through ILRP
 - * Achieved WQOs/TMDL in SJR before compliance date (Dec 2011)
 - * Delisted diazinon in 2 SJR segments in 2010

Stockton DWSC Dissolved Oxygen TMDL

- * Primary source of oxygen demand coming from upstream sources (e.g., algae, City of Stockton, and upstream NPS)
- * Named in toxic hotspots studies
- * Low DO/organic enrichment – 303(d) list
- * TMDL approved in 2007 by EPA
- * ILRP + NPDES, Water Right permit holders, geometry (US ACE)
- * Main Stem SJR WQOs, TMDL -concentration-based loading capacity
- * Implementation through study requirements and development of mitigation technology (studies and operation of new technology are underway)
- * TMDL allocations equal to the loading capacity

Salt (EC) and Boron

- * Current TMDL protects salinity and boron water quality objectives at Vernalis
- * CV-SALTS stakeholder lead initiative developing environmentally and economically sustainable salt and nitrate management plan for the entire Central Valley.
 - * Timeline:
 - * Major policy discussions and technical work NOW
 - * Draft Plan May 2014

Lower San Joaquin River Committee

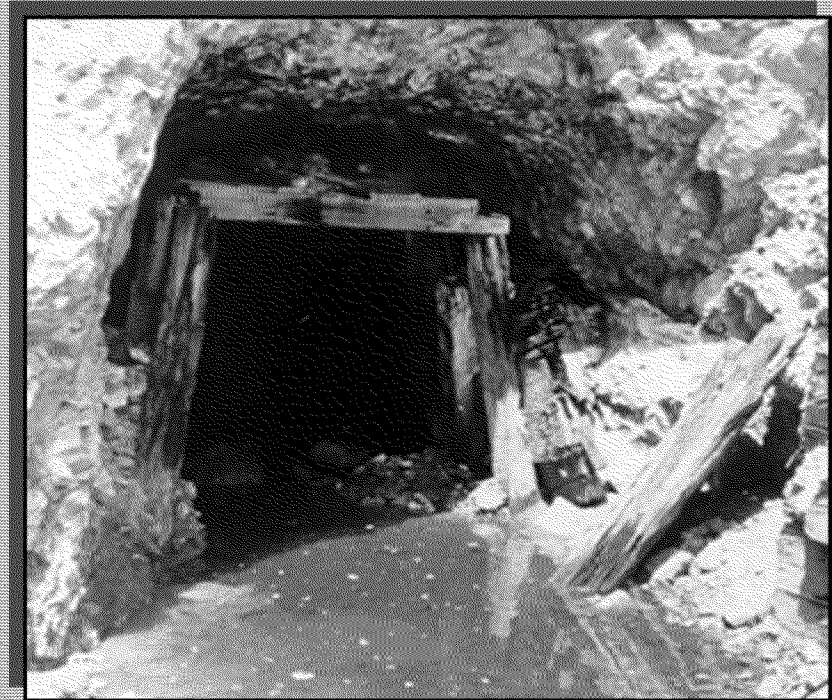
- * Develop appropriate salt and boron water quality objectives for the SJR between the Merced River and Vernalis
 - * Appropriate Beneficial Uses
 - * Protective Water Quality Objectives
 - * Preferred Implementation
 - * TMDL/Load Allocations
 - * Realtime Management
 - * Other

Realtime Management

- * Current TMDL to protect Vernalis has two options
 - * WDR to set load allocations
 - * Realtime water quality management to utilize assimilative capacity of the river to move salt out of the basin
- * MAA with the US Bureau of Reclamation
 - * Facilitate development of a Water Board approved Realtime Management Program

Mercury

- * Delta Mercury Control Program (TMDL)
- * San Joaquin River- future TMDL
- * Statewide Mercury Impaired Reservoirs
 - * New Melones Reservoir
 - * Tulloch Reservoir
 - * McClure Reservoir
 - * Modesto Reservoir
 - * Turlock Lake
 - * Woodward Reservoir
 - * Don Pedro Lake
 - * Hetch Hetchy Reservoir



Statewide Mercury Control Program for Reservoirs

- * Program Elements

- * Inorganic sources

- * Controls for mines, wastewater, storm water, atmospheric deposition

- * Reservoir management

- * Evaluate water management & chemistry, nutrients

- * Fisheries management

- * Evaluate current fisheries management practices for native and non-native species

Permitting

Surface Water discharges

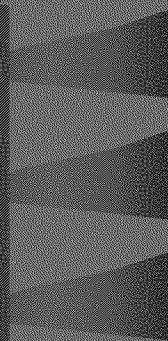
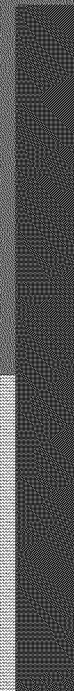
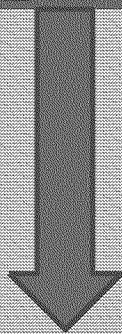
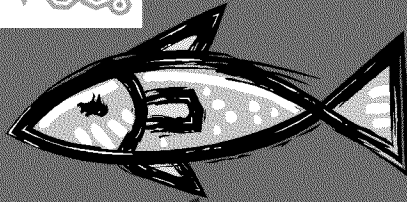
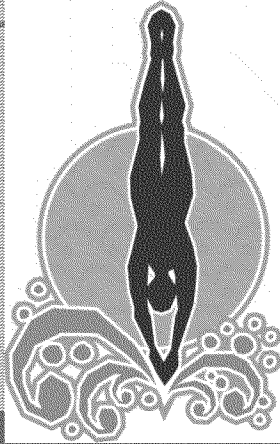
- * CWA 402 – NPDES – State and Regional Boards
 - * Ag irrigation and stormwater wastewater exemptions
- * CWA 404 – USACOE
 - * Dredge & fill
 - * In water or below high water line construction
 - * Wetlands construction, habitat restoration, intake maintenance
- * CWA 401 WQ Certifications
 - * Actions other than for FERC hydropower
 - * FERC hydropower
- * California Water Code
 - * irrigated ag discharges
 - * dredge/fill activities

NPDES Permits

National Pollutant Discharge Elimination System

- * Determine pollutants in discharge
- * Effluent limits if “reasonable potential” to cause river to exceed objectives
- * Effluent limits \leq water quality objectives, or
- * Characterize receiving water and consider dilution
 - * Set effluent limits to protect river after mixing

D George to River



City of Angels outfall

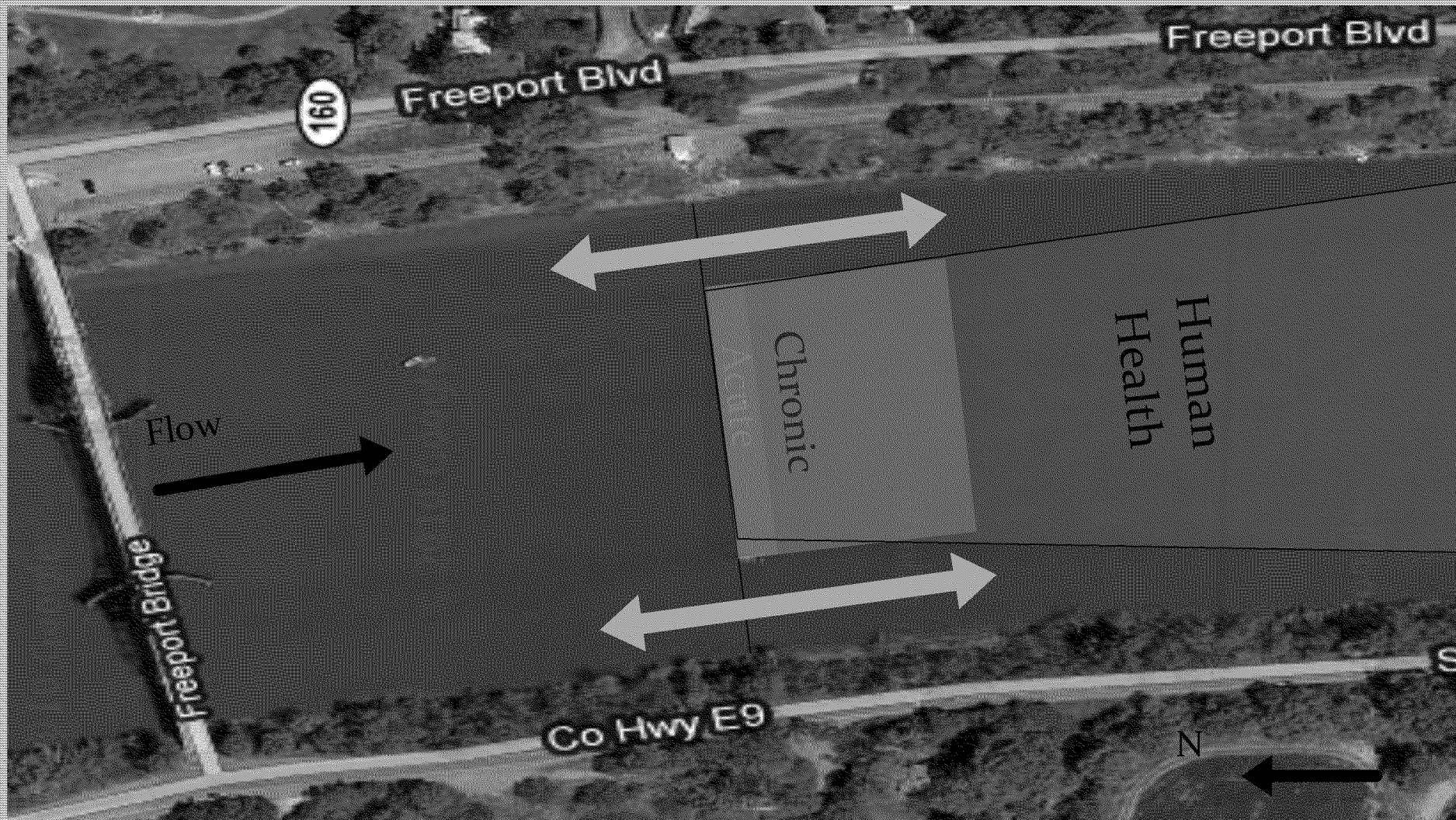


Agenda Item # 13

Central Valley Water Board Meeting
14 October 2012

10/20/2011

Sacramento Regional outfall



NPDES Permit types

- * Individually adopted permits
 - * Sewage treatment plants, large industries
 - * Large municipal stormwater permits
 - * MS4s – municipal separate storm sewers
 - * Months to years to adopt
- * General NPDES Permits
 - * Groups of similar discharges with similar conditions
 - * Low threat (no NPDES exemptions)
 - * Dewatering
 - * Construction stormwater
 - * Industrial stormwater (corporation yards)
 - * Hours to months to obtain administratively

401 Certifications

- * Certify compliance with State regulations for federal permits or actions
 - * US Army Corps of Engineers 404 Permits
 - * Certain types of grant / loans
 - * FERC Permits
- * FERC and water diversion related Certifications handled by State Board, Division of Water Rights
- * The rest handled by Regional Board

Non-FERC Water Quality Certs

- * Types of projects
 - * Dredge & fill
 - * In water or below high water line construction
 - * Wetlands construction, habitat restoration, intake maintenance, reservoir valve repair
- * The need for a Cert depends on USACOE
 - * Routine activities handled by general Corps permits
 - * State Board has certified some Corps permits
- * All projects without general certification need individual certifications by Regional Board

Non-FERC Water Quality Certs

- * Processing
 - * Application describing project
 - * Information on Corps permit
 - * Wetland delineation and mitigation for any loss
 - * Fee
 - * CEQA
- * Public comment period
 - * Application posted on web for 21 days

FERC and 401 Certifications

California Water Code

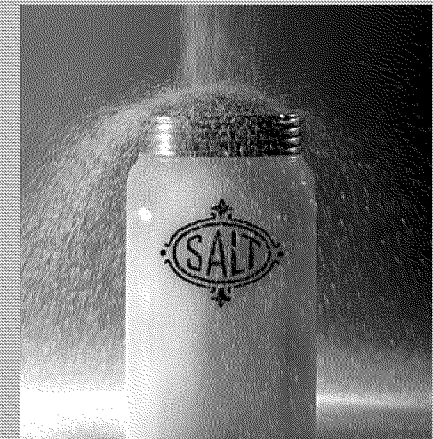
- * Handle surface water discharges exempt from NPDES
- * Irrigated Lands Regulatory Program
 - * 7.5 million acres irrigated ag
 - * Coalitions to conduct most work
 - * River monitoring to identify pollution problems
 - * Develop and implement management strategies
- * Dredging
 - * General WDRs new construction & maintenance
 - * Serves as 401 WQ Certification

CEQA

- * NPDES Process is CEQA equivalent
- * Basin Planning / TMDLs functionally equivalent
- * CEQA needed for
 - * 401 Certifications
 - * Waste Discharge Requirements



- * Broad Stakeholder Participation
 - * Appropriate designation and levels of protection for MUN and AGR
 - * Implementation that leads to sustainability
 - * Case studies to ground-truth recommendations
 - * MUN in ag dominated water bodies
 - * MUN in groundwater basins
 - * AGR in management zones
 - * Lower San Joaquin River



Central Valley Drinking Water Policy

- * **Scope:** Surface waters of the Delta and its tributaries below rim dams
- * **Elements:**
 - Compilation of existing Basin Plan elements to protect drinking water
 - Narrative objective for *Cryptosporidium* and *Giardia*
 - Numeric triggers based on US EPA drinking water regulations
 - Trigger exceedance prompts Water Board investigation, not a violation of objective
- * **Status:**
 - Central Valley Drinking Water Policy Workgroup consultation on development of draft Basin Plan Amendment and Staff Report
 - Public Review of draft Basin Plan Amendment and Staff Report – January 2013

Monitoring Directory

- * <http://www.centralvalleymonitoring.org/>
- * 05/06 Began initial development
- * 08/09 Additional funds were added
- * Provides access to program and metadata for current water quality monitoring efforts in the Central Valley
- * Improves coordination
- * Links to water quality data from source

Central Valley Monitoring Directory

Is a web-based tool that provides access to program details for current water quality monitoring efforts

Developed and maintained by the Aquatic Science Center

Features include:

- * Interactive map of monitoring locations
- * Tabbed summary tables of programs, agencies, and parameters
- * Individual program pages that identify the lead agency and partners.
- * Ability for program directors to upload their monitoring information into the directory

Available at

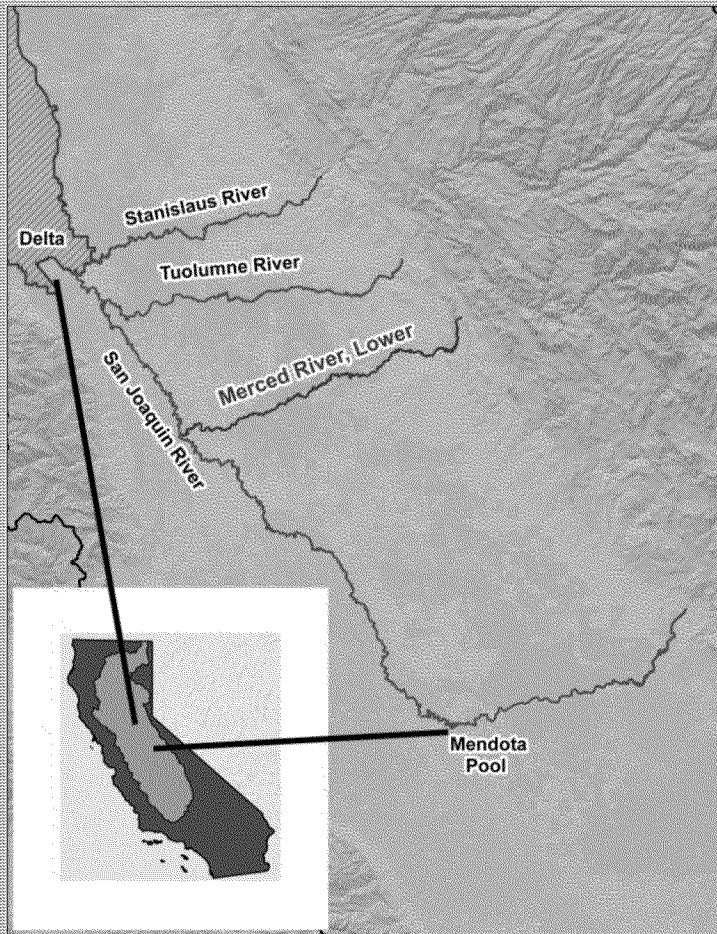
www.centralvalleymonitoring.org

The screenshot displays the Central Valley Monitoring Directory website. At the top, there's a navigation bar with links like 'Most Visited', 'Getting Started', 'BioFlow', 'MSN.com', 'Central Valley Region...', 'Inbox - tjditto@gmail...', and 'Region 5 Intranet'. Below this is a 'Main Directory' section with tabs for 'Basins', 'Ali', 'Delta', 'San Joaquin River', 'Tulare Lake', 'Sacramento River', and 'Unknown'. The main content area is divided into two parts: a map on the left showing California with monitoring locations marked, and a table on the right listing monitoring programs. The table has columns for Program, Lead Organization, No of Basin sites, Bioassessment, Bulk Organics, Disinfection Byproducts, General Sediment Quality, and General Water Quality. The table lists various programs like NPDES Self Monitoring, IEP Environmental Monitoring, DWR Operations & Maintenance, State Water Project Water Quality Monitoring, Source Water Monitoring, Sacramento River, Coordinated Monitoring Program, DWR San Joaquin District Surface Water Monitoring, and DWR San Joaquin District Surface Water Monitoring. At the bottom, there's a 'Download Excel' button.

Program	Lead Organization	No of Basin sites	Bioassessment	Bulk Organics	Disinfection Byproducts	General Sediment Quality	General Water Quality
<input checked="" type="checkbox"/> NPDES Self Monitoring Program	CVRWQCB	494	Delta, Sacramento River, San Joaquin River, Tulare Lake	19 sites	18 sites	100 sites	6 sites
<input checked="" type="checkbox"/> IEP Environmental Monitoring	IEP	9	Delta				9 sites
<input checked="" type="checkbox"/> Programs: Discrete Water Quality Sampling							
<input checked="" type="checkbox"/> DWR Operations & Maintenance - State Water Project Water Quality Monitoring	DWR	8	Delta, Tulare Lake, San Joaquin River				8 sites
<input checked="" type="checkbox"/> Source Water Monitoring	CCWD	4	Delta	3 sites			4 sites
<input checked="" type="checkbox"/> Sacramento River	Sacramento RCSD	2	Delta				2 sites
<input checked="" type="checkbox"/> Coordinated Monitoring Program							
<input checked="" type="checkbox"/> DWR San Joaquin District Surface Water Monitoring	DWR	39	San Joaquin River, Delta, Tulare Lake				37 sites

San Joaquin River Basin

303(d) Listings

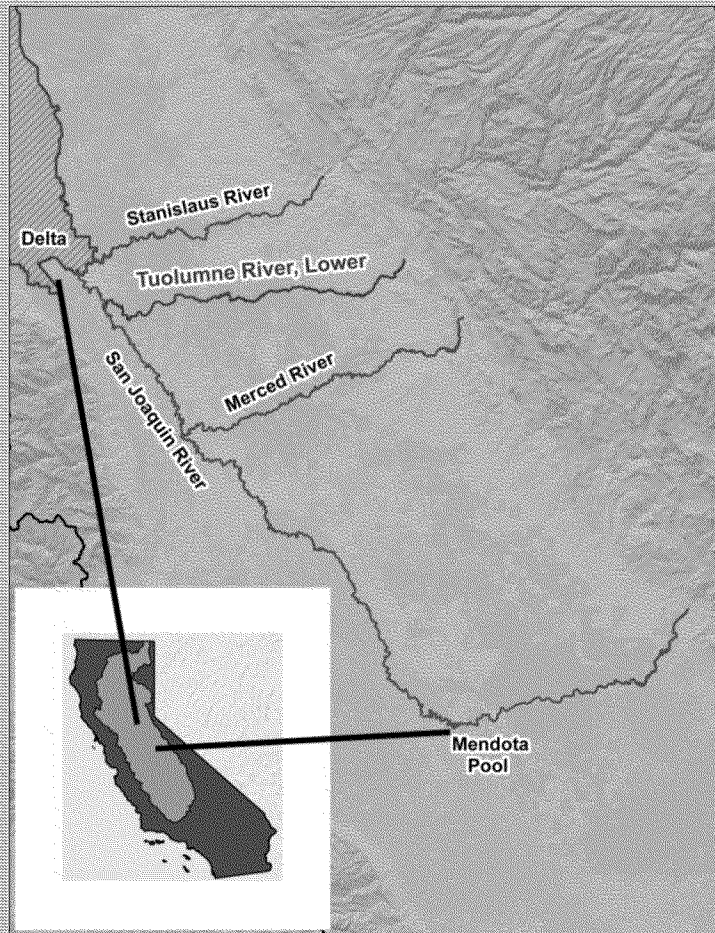


Merced River, Lower (McSwain Reservoir to San Joaquin River)

- * Chlorpyrifos**
- * Diazinon**
- * Escherichia coli (E. coli)
- * Group A Pesticides
- * Mercury
- * Temperature
- * Unknown Toxicity

San Joaquin River Basin

303(d) Listings

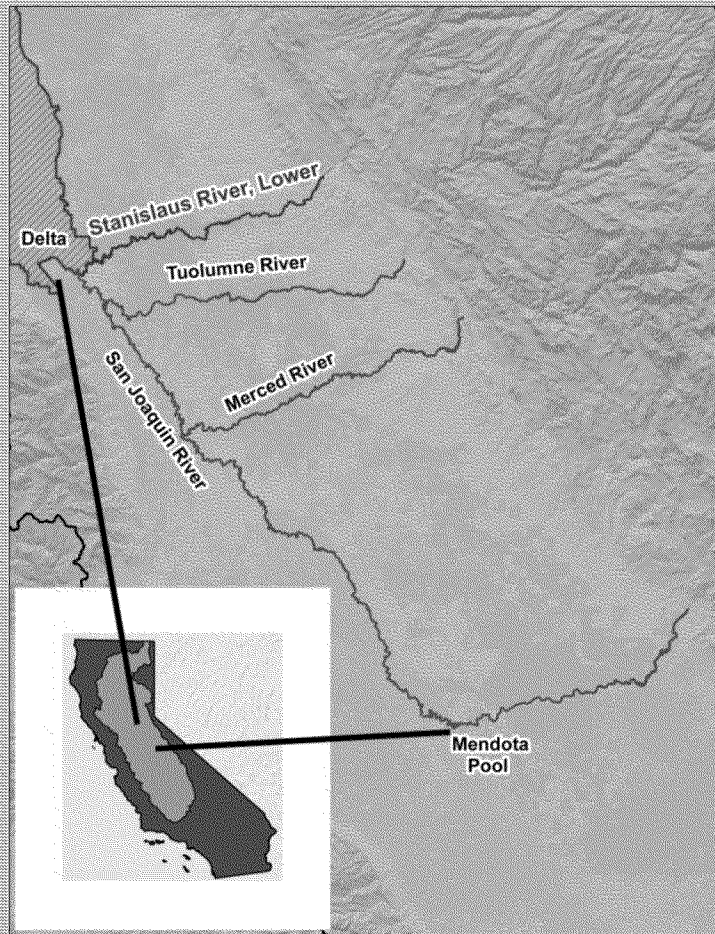


Tuolumne River, Lower (Don Pedro Reservoir to San Joaquin River)

- * Chlorpyrifos**
- * Diazinon**
- * Group A Pesticides
- * Mercury
- * Temperature
- * Unknown Toxicity

San Joaquin River Basin

303(d) Listings

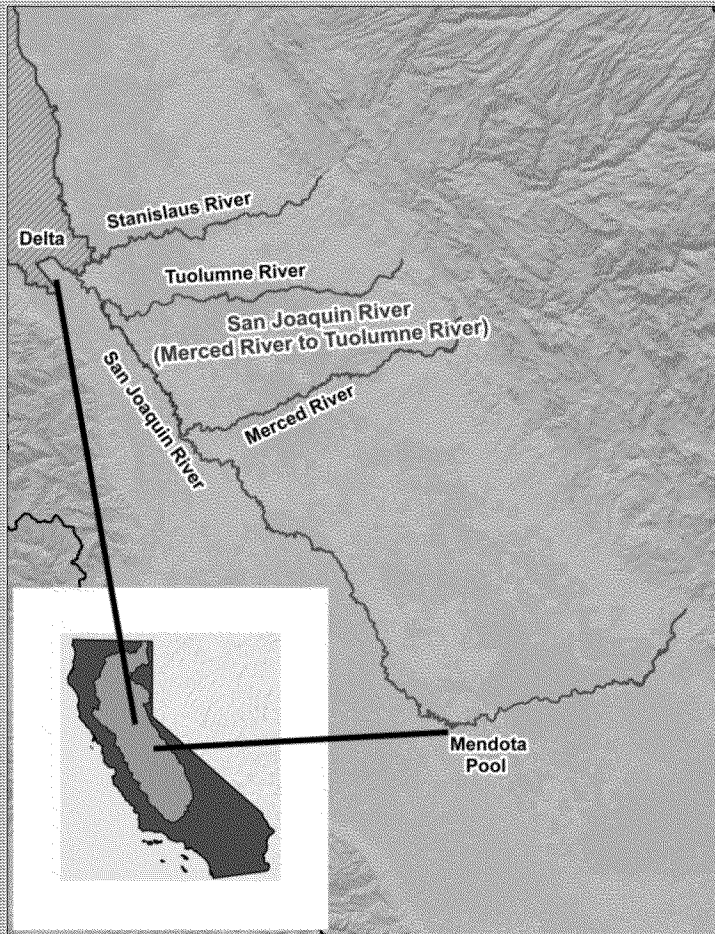


Stanislaus River, Lower

- * Chlorpyrifos**
- * Diazinon**
- * Group A Pesticides
- * Mercury
- * Temperature
- * Unknown Toxicity

San Joaquin River Basin

303(d) Listings

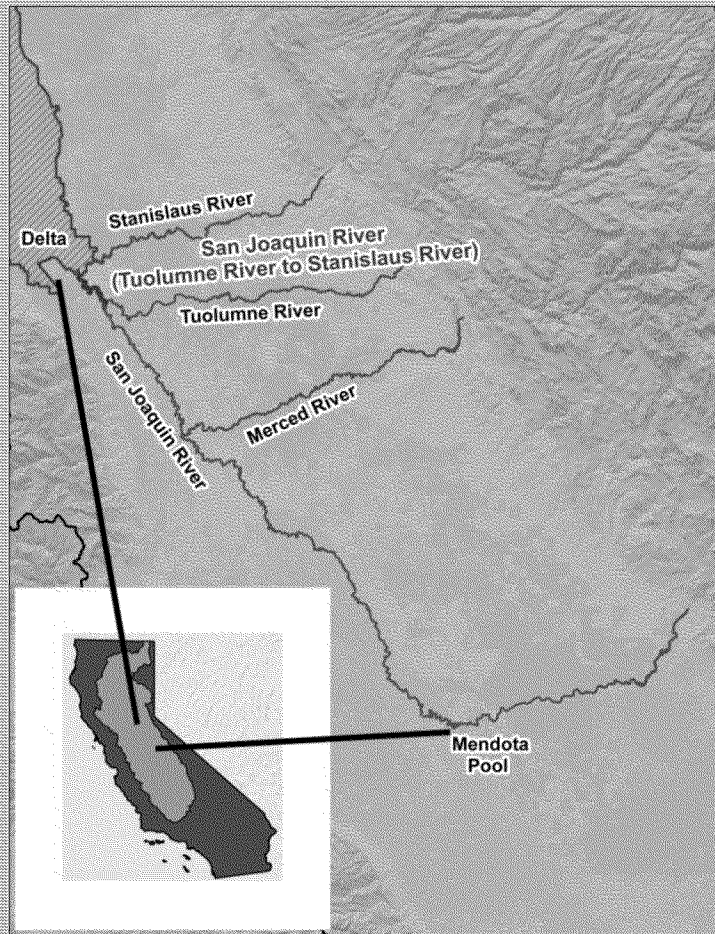


San Joaquin River (Merced River to Tuolumne River)

- * Boron
- * Chlorpyrifos*
- * DDE
- * DDT
- * Electrical Conductivity
- * Group A Pesticides
- * Mercury
- * Temperature
- * Unknown Toxicity
- * alpha-BHC (alpha-HCH)

San Joaquin River Basin

303(d) Listings

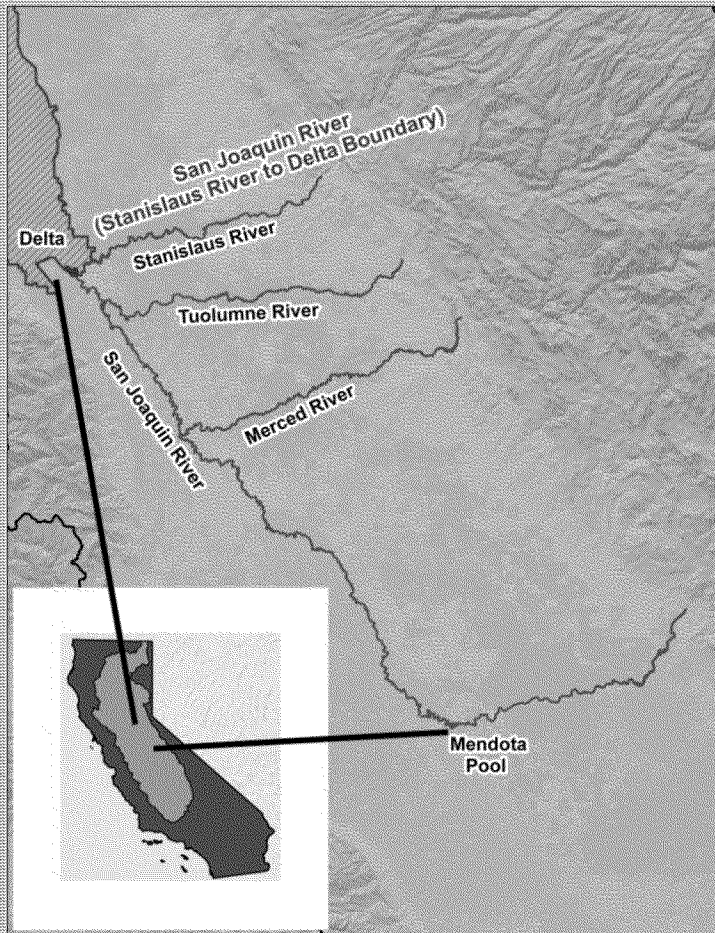


San Joaquin River (Tuolumne River to Stanislaus River)

- * Chlorpyrifos*
- * DDT
(Dichlorodiphenyltrichloroethane)
- * Diazinon*
- * Electrical Conductivity
- * Group A Pesticides
- * Mercury
- * Temperature
- * Unknown Toxicity

San Joaquin River Basin

303(d) Listings



San Joaquin River (Stanislaus River to Delta Boundary)

- * Chlorpyrifos*
- * DDE
- * DDT
- * Diuron**
- * Electrical Conductivity*
- * Escherichia coli (E. coli)
- * Group A Pesticides
- * Mercury
- * Temperature
- * Toxaphene
- * Unknown Toxicity